TECHNICAL WORK MAY NOT BEGIN PRIOR TO CO APPROVAL

NASA/GODDARD SPACE FLIGHT CENTER

REQUEST FOR TASK PLAN / TASK ORDER

CONTRACTOR	CONTRACT NO./TASK NO.			JOB ORDER NUMBER	APPROP. FY
	NAS5-	TASK NO.	AMENDMENT		
QSS Group, Inc.	99124	19	[redacted]	730-297-20-01-89	99

TASK TITLE: (NTE 80 characters; include Project name)

Subsystem Interface Integration (SII) Phase III-A

APPROVALS: (Type or print name and sign)

	DATE	ORG CODE	MAIL CODE	PHONE
ASSISTANT TECHNICAL REPRESENTATIVE (OR TASK MONITOR) Harold Frisch	4/12/99	730	730	301-286-8730
BRANCH HEAD Jim Andary	4/12/99	CODE 730		PHONE 301-286-2269
CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE (COTR) for Fred Huegel	4/14/99	CODE 568		PHONE 301-286-2285

FLIGHT HARDWARE, CRITICAL GSE OR SOFTWARE? *(IF YES, NEED CODE 303 CONCURRENCE NEXT BLOCK)*	CONTRACTING OFFICER'S QUALITY REP.	DESIGNATED FAM:
[X] NO [ ] YES	Larry Moore	

The contractor shall identify and explain the reason for any deviations, exceptions, or conditional assumptions taken with respect to this Task Order or to any of the technical requirements of the Task Order Statement of Work and related specifications. The contractor shall complete and submit the required Reps and Certs.

(To be completed by Contracting Officer)
C.O. Requested Quote on:
Date: APR 19 1999

Contractor will develop specification or statement of work under this task for a future procurement. [X] NO [ ] YES

Flight hardware will be shipped to GSFC for testing prior to final delivery. [ ] NO [ ] YES [X] N/A

Government Furnished Property/Facilities: [X] NO [ ] YES -- SEE LIST OF GFP (offsite only) / FACILITIES (onsite only)

Onsite Performance: [X] NO [ ] YES If yes: [ ] TOTAL [ ] PARTIAL
If partial, indicate onsite work in SOW by asterisk (*)

Surveillance Plan Attached: [X] NO [ ] YES

Highlighted Contract Clauses: *(to be completed by Contracting Officer)*

Per Clause H.14, Task Ordering Procedure, subparagraph (f), the effective date of this task order shall be May 3, 1999.

The "Handling of Data" clause applies to this task.

INCENTIVE FEE STRUCTURE (check one)

(See Contract NAS5-99124, Attachment K, Incentive Fee Plan)

	___ No. 1	___ No. 2	_X_ No. 3	___ No. 4	___ No. 5
Cost	10%	50%	25%	25%	%
Schedule	15%	25%	25%	50%	%
Technical	75%	25%	50%	25%	%

(To be completed by Contracting Officer)

The target cost of this task order is $ 30,650.
The target fee of this task order is $ 113.
The total target cost and target fee of this task order as contemplated by the Incentive Fee clause of this contract is $ 30,763.

The maximum fee is $ 165.
The minimum fee is $0.

AUTHORIZED SIGNATURE:

THIS TASK ASSIGNMENT IS ISSUED ACCORDING TO THE CONTRACT CLAUSE "TASK ASSIGNMENTS AND REPORTS"

Lorrie L. Eakin — SIGNATURE OF CONTRACTING OFFICER

9/24/99 — DATE

Lorrie L. Eakin
Contracting Officer — TYPED NAME OF CONTRACTING OFFICER

CONTRACTOR'S ACCEPTANCE:

AUTHORIZED SIGNATURE — DATE

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Applicable paragraphs from contract Statement of Work:

STATEMENT OF WORK:

1.0 Scope

The objective of the Subsystem Interface Integration (SII) program is to develop an approach to control system design that utilizes interface standardization to integrate design, analysis, and simulation processes that will improve efficiency and reduce cost over current methods.

This approach relies on International Standards Organization (ISO) 10303 to provide a computer interpretable data modeling format to define an information interface for control system components whose instances may be shared across design, analysis, and simulation applications.

Phase I of the SII project focused on using STEP (Standard for the Exchange of Product Data) technologies to model and share interface information models. This included developing an EXPRESS schema to represent component information interface data for a specific control system component; developing an object oriented database structure for storing, managing, and retrieving that data; and creating an interface to two specific user application that accesses the component data model.

Phase II of SII is focused on expanding the number of control system components represented by the data model from one to four, refining the graphical user interface, defining a validation scenario, and creating an implementation plan.

(Continued)

PERFORMANCE SPECIFICATIONS:

The user interface shall provide access to the SII database and client applications. The use of Web-based technologies shall be strongly considered for the design. This will enable wider accessibility and provide enhanced capability for users of the software to enter and/or retrieve component data directly from manufacturer Internet sites. For validation and testing purposes, the interface shall be linked to a flight software header file generator and a system simulation application (such as Matlab/Simulink or MatrixX). The Matlab/MatrixX application will enable a closed-loop analysis of an avionic subsystem using the components modeled in the SII database.

The user interface shall be made available to NASA and to potential industry users. See SOW for more performance specifications.

APPLICABLE DOCUMENTS:

Status reports (both technical and financial), briefing material and documentation resulting from discussions with vendors and changes to STEP-SII Express schema.

TASK END DATE: 12/18/99

MILESTONES/DELIVERABLES AND DATES:

Enhancements to STEP SII EXPRESS schema: 9/30/99

-- User interface software to access SII database and client applications via Web.

-- List of Phase III B vendor participants

PERFORMANCE STANDARDS:

Schedule: On-time delivery of the above schema.

Technical: ATR's acceptance of the above.

FINAL DELIVERY DESTINATION (NAME, BLDG, ROOM):

Harold Frisch, building 23, room W443

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STATEMENT OF WORK: (Continued)

Phase III will be broken into two parts. Phase III-A will involve some additional development of the EXPRESS schema and user interface, development of a standardized data format for the classes of components modeled in SII, and selection of one or more component vendors to participate in a test scenario for SII. These activities will serve as prerequisites for Phase III-B, which will demonstrate SII against a real-world system to validate its benefit in avionic component selection, analysis, and simulation.

2.0 Requirements

2.1 Further Development of Component Schema and User Interface

This task involves refining the EXPRESS component schema and user interface developed in Phase II.

To further widen the scope of the component schema, an entity to model the linear functionality of and between avionic components will be added. This entity would model the control laws through references to transfer functions and component meta-data.

The user interface shall provide access to the SII database and client applications. The use of Web-based technologies shall be strongly considered for the design. This will enable wider accessibility and provide enhanced capability for users of the software to enter and/or retrieve component data directly from manufacturer Internet sites. For validation and testing purposes, the interface shall be linked to a flight software header file generator and a system simulation application (such as Matlab/Simulink or MatrixX). The Matlab/MatrixX application will enable a closed-loop analysis of an avionic subsystem using the components modeled in the SII database.

The addition of linear functionality to the SII EXPRESS model will encourage the development of client applications with a more intensive mathematical basis. A client based on the OpenMath set of protocols shall be considered. Transformation of the MatrixX/Matlab client into a comparable OpenMath version shall be investigated and documented.

Effort will continue on finalizing integration of the SII component schema with the ISO dictionary schema for electronic components to provide a complete resource for subsystem devices.

The user interface shall be made available to NASA and to potential industry users.

2.2 Development of Data Format Standard

This task will involve creating a standard format for the SII avionic components that will allow vendors to register component data to be easily read into the SII database. The format structure shall be developed from a consensus, with primary feedback from prospective vendors who will participate in an SII implementation.

With the ability to access and download vendor component data over a web browser being a primary goal, the data format should be compatible with the Internet medium. Extensible Markup Language (XML) technologies shall be considered for this task. The XML capacity to create customized document types will provide the means for designing the standard format to conform to SII requirements.

The format for component data entry should be a standard one for all vendors. To gain vendor acceptance and to protect potential proprietary information, a data encryption mechanism will be used for data transmittal and storage. Categories of users should be defined with different sets of permissions to account for the various levels of personnel who may have access to the data. Existing solutions with a proven record of secure data transfer will be examined to determine the best correlation with the SII project.

The deliverables for this task will be the standardized data format and associated documentation.

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QSS Group, Inc.	99124	19r	

STATEMENT OF WORK: (Continued)

2.3 Designation of Component Vendor(s) for Phase III-B

The goal for this task is to secure one or more component manufacturers/distributors to participate in a pilot demonstration of the SII project. The pilot will occur in Phase III-B. The vendor(s) will provide sufficiently detailed data on a component that could be used on a real-world program. The purpose of the pilot demonstration will be to validate the benefit of using SII in the selection, analysis, and simulation of avionic subsystem components.

A wide array of candidates should be considered for the vendors to assure the best chances for cooperation. Two primary sources will be members of the AIAA Guidance, Navigation, and Controls subcommittee and current vendors on Lockheed Martin programs. For the latter, the Hubble Space Telescope (HST), managed by Lockheed Martin Technical Operations (LMTO), is one such source. The existing contracts HST has with Allied Signal and Honeywell (for gyros and reaction wheels, respectively) should provide strong leverage.

As mentioned in 2.2 above, vendors will have input in the format and content of data for the component(s) that would be modeled. Changes to the subsystem interface EXPRESS schema will be made if necessary to better accommodate the demonstration scenario.

2.4 Coordination

This task shall include coordination between LMAS, NASA Goddard, LMTO, and any other participating organizations to understand the SII component schema development and the implementation of STEP in the ICD. This task includes travel, meeting, and status reports. Interaction with the AIAA GN&C committee should also occur to yield synergy with similar ongoing efforts.

The SSI website shall be maintained and updated on a regular basis throughout the length of the project. Deliverables for this task include the status reports (both technical and financial) and any briefing materials created to support the project. These materials shall also be made available through the SII website.